

Specifications



Eaton 169060

Eaton DA1 Variable frequency drive, 480 V AC, 3-phase, 21.8 A, IP20, NEMA Other, FS3, Radio interference, Brake chopper, Digital display

General specifications

PRODUCT NAME	Eaton DA1 Variable frequency drive
CATALOG NUMBER	169060
MODEL CODE	DA1-34018FB-A20C
EAN	4015081658749
PRODUCT LENGTH/DEPTH	204 mm
PRODUCT HEIGHT	273 mm
PRODUCT WIDTH	131 mm
PRODUCT WEIGHT	3.5 kg

CERTIFICATIONS

Certified by UL for use in
Canada
IEC/EN 61800-3
UL
UL 508C
EAC
IEC/EN61800-3
CUL
UL File No.: E172143
IEC/EN61800-5
Specification for general
requirements: IEC/EN
61800-2
RoHS, ISO 9001
Safety: EN 61800-5-1: 2003

UL Category Control No.:
NMMS, NMMS7
CE
UkrSEPRO
CSA-C22.2 No. 14
RCM
UL report applies to both
US and Canada

CATALOG NOTES

The brake resistors are
assigned based on the
maximum rated power of
the variable frequency
drive. Additional brake

Apparent power

APPARENT POWER AT 400 V 12.47 kVA

APPARENT POWER AT 480 V 14.96 kVA

Climatic environmental conditions

ALTITUDE Above 1000 m with 1 % derating per 100 m
Max. 4000 m
Max. 1000 m

AMBIENT OPERATING TEMPERATURE - MAX 50 °C

AMBIENT STORAGE TEMPERATURE - MAX 60 °C

AMBIENT OPERATING TEMPERATURE - MIN -10 °C

AMBIENT OPERATING TEMPERATURE AT 150% OVERLOAD - MAX 50 °C

AMBIENT OPERATING TEMPERATURE AT 150% OVERLOAD - MIN -10 °C

AMBIENT STORAGE TEMPERATURE - MIN -40 °C

CLIMATIC PROOFING < 95 average relative humidity (RH), no condensation, no corrosion

resistors and designs (e.g. different duty cycles) are available upon request.

Braking function

BRAKING RESISTANCE 50 Ω

BRAKING TORQUE Max. 30 % MN, Standard - Main circuit
Max. 100 % of rated operational current I_e , variable, DC - Main circuit
Max. 100 % of rated operational current I_e with external braking resistor - Main circuit

SWITCH-ON THRESHOLD FOR THE BRAKING TRANSISTOR 780 VDC

Control circuit

NUMBER OF INPUTS (ANALOG) 2

NUMBER OF INPUTS (DIGITAL) 5

NUMBER OF OUTPUTS (ANALOG) 2

NUMBER OF OUTPUTS (DIGITAL) 2

NUMBER OF RELAY OUTPUTS 2 (parameterizable, 1 N/O and 1 changeover contact, 6 A (250 V, AC-1) / 5 A (30 V, DC-1))

RATED CONTROL VOLTAGE (UC) 24 V DC (external, max. 100 mA)

Design verification

10.10 TEMPERATURE RISE	The panel builder is responsible for the temperature rise calculation. Eaton will provide heat dissipation data for the devices.
10.11 SHORT-CIRCUIT RATING	Is the panel builder's responsibility. The specifications for the switchgear must be observed.
10.12 ELECTROMAGNETIC COMPATIBILITY	Is the panel builder's responsibility. The specifications for the switchgear must be observed.
10.13 MECHANICAL FUNCTION	The device meets the requirements, provided the information in the instruction leaflet (IL) is observed.
10.2.2 CORROSION RESISTANCE	Meets the product standard's requirements.
10.2.3.1 VERIFICATION OF THERMAL STABILITY OF ENCLOSURES	Meets the product standard's requirements.
10.2.3.2 VERIFICATION OF RESISTANCE OF INSULATING MATERIALS TO NORMAL HEAT	Meets the product standard's requirements.
10.2.3.3 RESIST. OF INSUL. MAT. TO ABNORMAL HEAT/FIRE BY INTERNAL ELECT. EFFECTS	Meets the product standard's requirements.
10.2.4 RESISTANCE TO ULTRA-VIOLET (UV) RADIATION	Meets the product standard's requirements.
10.2.5 LIFTING	Does not apply, since the entire switchgear needs to be evaluated.
10.2.6 MECHANICAL IMPACT	Does not apply, since the entire switchgear needs to be evaluated.
10.2.7 INSCRIPTIONS	Meets the product standard's requirements.
10.3 DEGREE OF PROTECTION OF ASSEMBLIES	Does not apply, since the entire switchgear needs to be evaluated.
10.4 CLEARANCES AND CREEPAGE DISTANCES	Meets the product standard's requirements.
10.5 PROTECTION	Does not apply, since the

General information

CABLE LENGTH	C2 ≤ 5 m, Radio interference level, maximum motor cable length 200 m, screened, with motor choke, maximum permissible, Motor feeder 150 m, unscreened, maximum permissible, Motor feeder 100 m, screened, maximum permissible, Motor feeder 300 m, unscreened, with motor choke, maximum permissible, Motor feeder C3 ≤ 25 m, Radio interference level, maximum motor cable length
COMMUNICATION INTERFACE	EtherCAT, optional SmartWire-DT, optional CANopen®, built in Ethernet IP, optional PROFINET, optional Modbus RTU, built in OP-Bus (RS485), built in Modbus-TCP, optional DeviceNet, optional PROFIBUS, optional
CONNECTION TO SMARTWIRE-DT	In conjunction with DX-NET-SWD1 SmartWire DT module Yes
DEGREE OF PROTECTION	IP20 NEMA Other
ELECTROMAGNETIC COMPATIBILITY	1st and 2nd environments (according to EN 61800-3)
FITTED WITH:	7-digital display assembly Additional PCB protection Radio interference suppression filter IGBT inverter Control unit Internal DC link Brake chopper PC connection Breaking resistance
FRAME SIZE	FS3
FUNCTIONS	4-quadrant operation possible
MOUNTING POSITION	Vertical
PRODUCT CATEGORY	Variable frequency drives

AGAINST ELECTRIC SHOCK	entire switchgear needs to be evaluated.
10.6 INCORPORATION OF SWITCHING DEVICES AND COMPONENTS	Does not apply, since the entire switchgear needs to be evaluated.
10.7 INTERNAL ELECTRICAL CIRCUITS AND CONNECTIONS	Is the panel builder's responsibility.
10.8 CONNECTIONS FOR EXTERNAL CONDUCTORS	Is the panel builder's responsibility.
10.9.2 POWER-FREQUENCY ELECTRIC STRENGTH	Is the panel builder's responsibility.
10.9.3 IMPULSE WITHSTAND VOLTAGE	Is the panel builder's responsibility.
10.9.4 TESTING OF ENCLOSURES MADE OF INSULATING MATERIAL	Is the panel builder's responsibility.
EQUIPMENT HEAT DISSIPATION, CURRENT-DEPENDENT PVID	300 W
HEAT DISSIPATION CAPACITY PDISS	0 W
HEAT DISSIPATION PER POLE, CURRENT-DEPENDENT PVID	0 W
RATED OPERATIONAL CURRENT FOR SPECIFIED HEAT DISSIPATION (IN)	18 A
STATIC HEAT DISSIPATION, NON-CURRENT-DEPENDENT PVS	0 W

PROTECTION	Finger and back-of-hand proof, Protection against direct contact (BGV A3, VBG4)
PROTOCOL	Other bus systems EtherNet/IP DeviceNet PROFIBUS PROFINET IO CAN MODBUS TCP/IP
RADIO INTERFERENCE CLASS	C2, C3: depending on the motor cable length, the connected load, and ambient conditions. External radio interference suppression filters (optional) may be necessary. Optional external radio interference suppression filter for longer motor cable lengths and for use in different EMC environments
SAFETY FUNCTION/LEVEL	STO (Safe Torque Off, SIL2, PLc Cat 2)
SUITABLE FOR	Branch circuits, (UL/CSA)

Main circuit

EFFICIENCY	97 % (η)
HEAT DISSIPATION AT CURRENT/SPEED	112 W at 25% current and 50% speed 138 W at 50% current and 0% speed 138 W at 50% current and 50% speed 165 W at 100% current and 0% speed 172 W at 50% current and 90% speed 205 W at 100% current and 50% speed 271 W at 100% current and 90% speed 88 W at 25% current and 0% speed
INPUT CURRENT ILN AT 150% OVERLOAD	21.8 A
LEAKAGE CURRENT AT GROUND IPE - MAX	1.55 mA
MAINS SWITCH-ON FREQUENCY	Maximum of one time every 30 seconds
MAINS VOLTAGE - MAX	480 V
MAINS VOLTAGE - MIN	380 V
OPERATING MODE	Speed control with slip compensation U/f control Optional: Vector control with feedback (CLV) Sensorless vector control (SLV)
OUTPUT FREQUENCY - MAX	500 Hz
OUTPUT FREQUENCY - MIN	0 Hz
OUTPUT VOLTAGE (U2)	400 V AC, 3-phase 480 V AC, 3-phase
OVERLOAD CURRENT IL AT 150% OVERLOAD	27 A
RATED CONTROL SUPPLY VOLTAGE	10 V DC (Us, max. 10 mA)
RATED FREQUENCY - MAX	62 Hz
RATED FREQUENCY - MIN	48 Hz
RATED OPERATIONAL CURRENT (IE) AT 150% OVERLOAD	18 A
RATED OPERATIONAL POWER AT 380/400 V, 50 HZ, 3-PHASE	7.5 kW

Motor rating

ASSIGNED MOTOR
CURRENT IM AT 400 V, 50 HZ, 150% OVERLOAD 15.2 A

ASSIGNED MOTOR
CURRENT IM AT 440 - 480 V, 60 HZ, 150% OVERLOAD 14 A

ASSIGNED MOTOR
POWER AT 460/480 V, 60 HZ, 3-PHASE 10 HP

RATED OPERATIONAL VOLTAGE	480 V AC, 3-phase 400 V AC, 3-phase
RESOLUTION	0.1 Hz (Frequency resolution, setpoint value)
SHORT-CIRCUIT PROTECTION RATING	30 A, UL (Class CC or J), Safety device (fuse or miniature circuit-breaker), Power Wiring
STARTING CURRENT - MAX	200 %, IH, max. starting current (High Overload), for 4 seconds every 40 seconds, Power section
SUPPLY FREQUENCY	50/60 Hz
SWITCHING FREQUENCY	8 kHz, 4 - 24 kHz adjustable (audible), fPWM, Power section, Main circuit
SYSTEM CONFIGURATION TYPE	AC supply systems with earthed center point
VOLTAGE RATING - MAX	480 VAC

Resources

[eaton-powerxl-da1-dc1-de1-conformal-coating-ap040182-en-us.pdf](#)

[eaton-powerxl-da1-use-of-multiple-ramps-ap040031-en-us.pdf](#)

[eaton-powerxl-da1-i-o-configuration-ap040034-en-us.pdf](#)

[eaton-powerxl-da1-set-point-setting-ap040040-en-us.pdf](#)

[eaton-powerxl-da1-dc1-db1-de1-rapidlink5-firmware-update-ap040214-en-us.pdf](#)

[eaton-powerxl-da1-dc1-de1-system-bus-ap040022-en-us.pdf](#)

[eaton-powerxl-da1-operating-pm-bldc-motors-ap040051-en-us.pdf](#)

APPLICATION NOTES

[eaton-powerxl-dx-com-stick-3-ap040190-en-us.pdf](#)

[eaton-powerxl-da1-motor-vf-curves-induction-motors-ap040018-en-us.pdf](#)

[Electromagnetic compatibility \(EMC\)](#)

[eaton-powerxl-da1-derating-ap040039-en-us.pdf](#)

[eaton-powerxl-da1-master-slave-operation-ap040026-en-us.pdf](#)

[eaton-powerxl-vfd-dual-rating-ap040114-en-us.pdf](#)

[eaton-powerxl-da1-hoist-applications-ap040032-en-us.pdf](#)

[eaton-powerxl-da1-dc1-de1-internal-motor-protection-ap040016-en-us.pdf](#)

	Start, Stopp und Betrieb eaton-powerxl-da1-pid-controller-ap040025-en-us.pdf eaton-powerxl-da1-pointer-to-parameter-ap040133-en-us.pdf eaton-powerxl-da1-vector-control-induction-motors-ap040028-en-us.pdf eaton-powerxl-da1-droop-function-ap040023-en-us.pdf eaton-powerxl-da1-starting-stopping-operation-ap040030-en-us.pdf
BROCHURES	eaton-powerxl-variable-frequency-drives-dc1-da1-brochure-br040001en-en-us.pdf
CATALOGUES	eaton-drives-soft-starter-catalog-ca04020001zen-us.pdf
DECLARATIONS OF CONFORMITY	eaton-variable-frequency-drive-declaration-of-conformity-uk251145en.pdf eaton-variable-frequency-drive-declaration-of-conformity-eu250662en.pdf
DRAWINGS	eaton-frequency-inverter-dimensions-022.eps eaton-frequency-inverter-3d-drawing-013.eps
ECAD MODEL	DA-CE-ETN.DA1-34018FB-A20C
INSTALLATION INSTRUCTIONS	eaton-da1-variable-frequency-drive-il04020010z.pdf
INSTALLATION VIDEOS	Video PowerXL DA1 PowerXL Variable Frequency Drives DC1 and DA1 - EN
MANUALS AND USER GUIDES	eaton-powerxl-da1-installation-manual-mn04020005z-en-us.pdf MN040018_EN

	eaton-powerxl-da1-application-manual-mn04020006z-en-us.pdf eaton-powerxl-vfd-profinet-manual-mn040062en-us.pdf eaton-canopen-communication-manual-for-variable-frequency-drives-variable-speed-starters-da1-db1-dc1-de11-mn040019-en-us.pdf eaton-da1-variable-frequency-drive-mn040063-en-us.pdf
MCAD MODEL	DA-CS-da1 fs3 ip20 eaton-general-purpose-drives-mcad-drawings-da1-fs3-ip20.dwg
MULTIMEDIA	System solutions based on EtherCAT Looking for variable frequency drives DC1 and DA1 which can be used in harsh environments?
PRODUCT NOTIFICATIONS	eaton-drives-ecodesign-directive-mz040046en-en.pdf
SOFTWARE, FIRMWARE, AND APPLICATIONS	eaton-powerxl-dx-cbl-pc-1m5-usb-driver.zip eaton-powerxl-da1-ethercat-esi-for-omron-v311.zip eaton-powerxl-da1-profinet-gsdml-v226.zip eaton-powerxl-da1-profibus-gsd-v216.zip eaton-powerxl-da1-profinet-tia-v12-library.zip eaton-powerxl-da1-canopen-eds-v250.zip eaton-powerxl-pcsoftware-drivesconnect-v1501.zip eaton-powerxl-dx-comstick3-ble-drivers.zip eaton-powerxl-dx-cbl-pc-3m0-usb-driver.zip

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ethercat-esi-v310.zip](#)

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firmware-release-note-
mz040041en-us.pdf](#)

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devicenet-eds-v100.zip](#)

[eaton-powerxl-da1-
canopen-codesys-v3-
library.zip](#)

PROJECT NAME:

PROJECT NUMBER:

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